

The Impact of Flow Control and Tax Reform on Ownership and Growth in the U.S. Waste-to-Energy Industry

by John Carlin*

Two issues, tax reform and developments in the practice of solid waste “flow control,” are reshaping investment, and therefore patterns of growth and ownership, in the U.S. waste-to-energy industry. The Tax Reform Act of 1986 created a less favorable climate for private investment in waste-to-energy facilities. Once the act’s impact is fully felt, private investment in less capital-intensive alternatives, such as landfills, will probably increase, and waste-to-energy facilities will be less likely to be privately owned.

Until recently, municipalities could implement flow control—the practice of ensuring that solid waste from a given jurisdiction was sent to a designated disposal facility—by enacting laws or ordinances or by applying economic incentives or disincentives. A May 1994 Supreme Court ruling struck down legislated flow control, and its fate now rests with Congress, which is considering several bills that would authorize flow control by municipalities and States. The failure to enact such legislation would further constrain the growth of waste-to-energy facilities in favor of landfills. However, the use of private waste-to-energy facilities not directly affiliated with municipalities would probably increase.

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Introduction

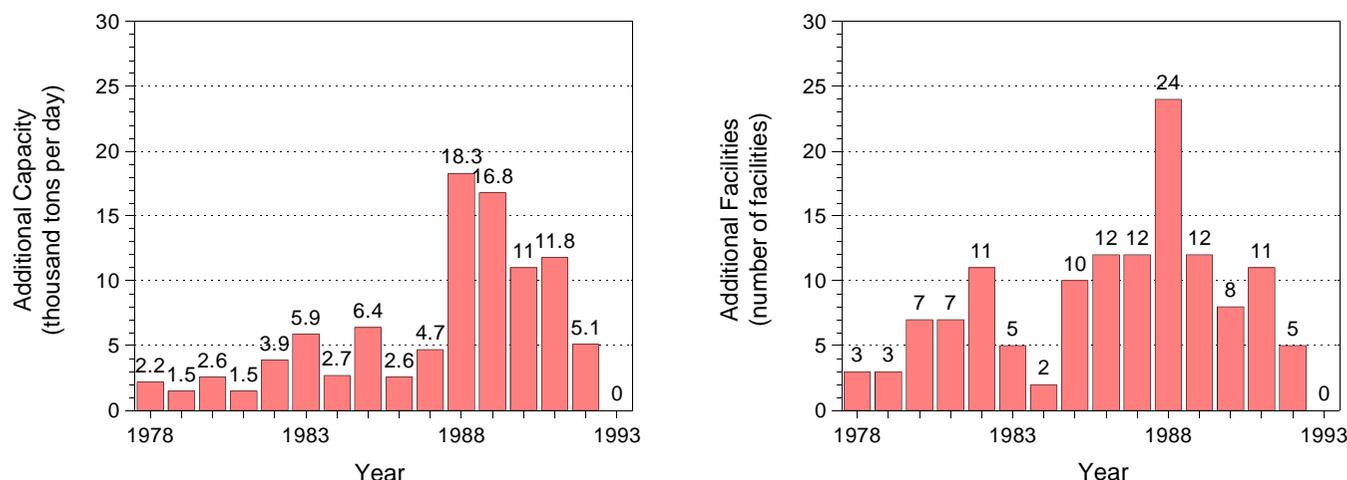
Until recently, the waste-to-energy (WTE)¹ component of the municipal solid waste (MSW) industry was one of the most rapidly growing applications of renewable energy. The WTE industry grew from virtually nothing in the late 1970’s—before the passage of the Public Utility Regulatory Policies Act of 1978 (PURPA, Public Law 95–617) guaranteed a market for its energy—to approximately 0.3 quadrillion British thermal units (Btu)² in 1990. At least eight new facilities became operational each year from 1985 through 1991, and large annual additions to capacity occurred from 1988 through 1991 (Figure 1). The growth slowed during 1992, however, and in 1993 there were no new additions to capacity.

This article analyzes two key issues that could be influencing growth and ownership (both public and private) in the WTE industry. First, it discusses several aspects of the

¹The WTE industry is defined as those facilities that combust waste into energy. It does not include those facilities that convert landfill gas into marketable energy.

²The British thermal unit (Btu) is a measure of energy. One Btu is the amount of energy required to raise the temperature of 1 pound of water at 39.2 degrees Fahrenheit by 1 degree. One quadrillion (10¹⁵) Btu equals the energy content of approximately 170 million barrels of crude oil.

Figure 1. Annual Additions of Waste-to-Energy Capacity and Facilities, 1978–1993



Source: Figure developed by the Energy Information Administration, based on data from Eileen B. Berenyi and Robert N. Gould, *Resource Recovery Yearbook* (New York: Governmental Advisory Associates, Inc., 1993), pp. 229–670.

legislative and judicial treatment of the industry's ability to control waste feedstocks, including the uncertainty created by litigation over attempts by municipalities to direct the flow of waste to particular facilities; the May 16, 1994, ruling by the U.S. Supreme Court that such municipal ordinances are unconstitutional;³ and possible congressional responses to that Supreme Court ruling. Second, the article discusses the impact of relevant provisions of the Tax Reform Act of 1986.

Securing waste feedstocks with either flow control or private contracts (i.e., contracts between waste disposal facilities and private parties, such as individual firms or homeowners' associations) is a technique used to enhance the prospects for the financial success of a particular waste disposal site or facility. Flow control (see box) can be either "legislated" or "economic." Legislated flow control occurs when State and local governments, acting in their capacity as waste managers, enact laws, regulations, and ordinances directing the flow of waste to particular facilities. These facilities may be publicly or privately owned, with the government acting as a "market regulator." Economic flow control has a similar objective, except that the government uses tools such as subsidies and taxes (but not legislation) to control the flow of waste. If a facility operating under the auspices of economic flow control happens to be publicly owned, the government is acting as a "market participant." The emphasis in this article is on legislated flow control. Unless the term economic flow control is explicitly used, flow control refers to legislated flow control.

On May 16, 1994, the U.S. Supreme Court declared unconstitutional a Clarkstown, New York, flow control ordinance on the grounds that it unfairly regulated interstate commerce and, therefore, violated the commerce clause of the U.S. Constitution. Because almost all of the new capacity coming on-line from 1990 through 1992 was financed with bonds secured with legislated flow control, this decision could affect the growth of the WTE industry. These contracts could be interpreted to be illegal and nonbinding and, therefore, unavailable as a means to secure financing and investment in new capacity. By using its authority to regulate interstate commerce, however, Congress could enact a law authorizing legislated flow control. Currently, there are draft bills in both houses of Congress. S. 2227 authorizes flow control for existing and new WTE facilities. H.R. 4683, on the other hand, limits flow control to existing facilities and proposed facilities that have already committed to use it. The Senate version would eventually phase out flow control. Municipalities would be limited to economic flow control or market forces.

The Tax Reform Act of 1986 has also affected investment in the capital-intensive WTE industry. The act limits the amount of tax-free bonds that can be issued by States for privately owned waste facilities and removes certain tax subsidies that privately owned facilities previously enjoyed. To date, almost all of the privately owned WTE facilities that have been constructed or are under construction have qualified for treatment under the old tax laws. Once the act's effects are fully felt, it will encourage public ownership of

³*C&A Carbone, Inc. v. Town of Clarkstown, New York*, No. 114, S. Ct. 1677 (1994).

Flow Control Characteristics

Generally, flow control can be defined as the laws, regulations, and economic incentives or disincentives used by waste managers to direct waste generated in a specific geographic area to a designated landfill, recycling, or WTE facility. In some cases, the waste may be delivered first to a transfer station, then sorted and reshipped. The specific form and mix of controls instituted by State and local governments depend on the objectives desired.

By far the most frequently used rationale for choosing flow control is to ensure the financial viability of a WTE facility by providing a reliable, long-term supply of raw materials. This ensures the facility of obtaining revenues from tipping fees (charges for waste disposal at the facility) and the sale of electricity or steam or both, and, in some cases, from the sale of materials for recycling, depending on the type of waste disposal facility designated to receive the waste. This assurance is critical in raising capital to finance the construction of a facility.

Legal and regulatory flow control (legislated) can be implemented in several ways. The municipality may collect and dispose of the waste with government employees and vehicles, contract with private haulers for some portion of the process, or grant permits, licenses, or franchises for the collection, transportation, and disposal of waste only to those entities that deliver the waste to a designated facility. Local laws and ordinances to direct waste flows are usually authorized, required, or supported by State governments.

Economic flow control combines market forces with tools such as subsidies, grants, fees, and taxes to the extent necessary to control waste flows. It attempts to direct the movement of waste without legal or regulatory controls. The distinction between legislated and economic flow control is critical to the development of defense strategies against legal challenges.

Publicly owned WTE facilities and certain privately owned facilities that are affiliated with municipalities can engage in either legislated or economic flow control. A third category, called merchant facilities, are independently constructed by entrepreneurs without municipal involvement in guaranteeing waste flows. Merchant facilities usually employ private contracts to secure waste supplies.

new WTE facilities (reversing the trend toward private ownership) and less capital-intensive forms of waste disposal instead of new WTE capacity. Further, if Congress does not authorize legislated flow control as a waste management tool for municipalities, growth in the WTE industry could be further slowed.

Background

At the end of 1993, there were 114 WTE facilities operating in the United States, with a combined capacity of almost 97 thousand tons per day.^{4,5} Seventy-five percent of the facilities and 87 percent of the capacity are located in States east of the Mississippi River (Figure 2). The six States with the largest amount of capacity—Florida, New York, Massachusetts, Pennsylvania, Virginia, and Connecticut—represent almost 60 percent of the total capacity in the Nation. Landfill space is at a premium in these States because of high

⁴One ton of MSW is equivalent to approximately 10 million Btu, depending on the content of the waste. Together, in 1993 these WTE facilities produced energy equivalent to the average annual output of nearly seven typical (400 megawatt) coal-fired power plants.

⁵Eileen B. Berenyi and Robert N. Gould, *Resource Recovery Yearbook* (New York: Governmental Advisory Associates, Inc., 1993), pp. 229–670. This article uses a subset of the Governmental Advisory Associates (GAA) survey data and includes only the facilities that market energy. It does not include the facilities that only process refuse-derived fuel (MSW that has been processed to remove noncombustible material) to be sold to other facilities for combustion, or incinerators that do not market energy.

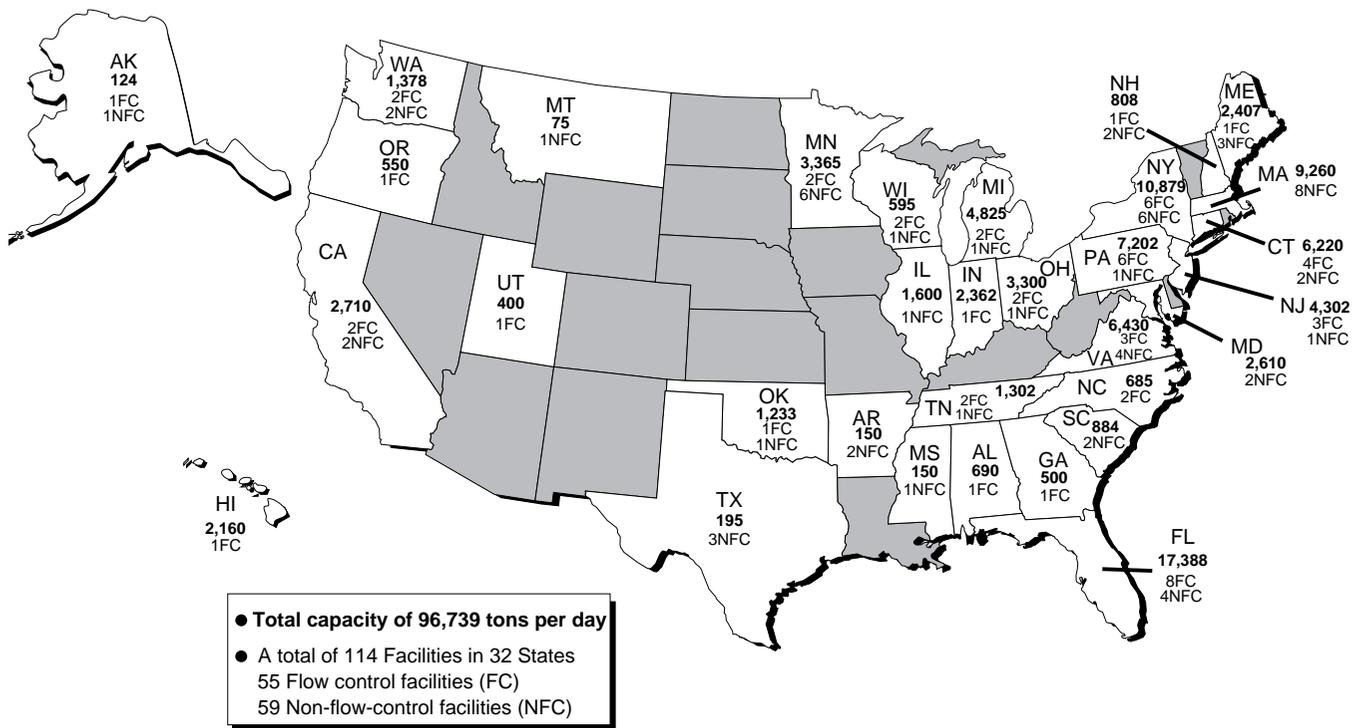
water tables, high population densities, or other reasons. Incinerating waste reduces its volume by approximately 90 percent, preserving scarce landfill space.

Almost 58 percent of the total current WTE capacity was financed and constructed in conjunction with flow control agreements. The use of this technique appears to be evenly distributed throughout the Nation. Of the 32 States with WTE facilities, eight—Arkansas, Illinois, Maryland, Massachusetts, Mississippi, Montana, South Carolina, and Texas—do not employ flow control.

The number of flow control facilities in each State does not always fully reflect the influence of flow control as a policy option. In testimony at the Environmental Protection Agency (EPA) hearings, for example, officials from Minnesota and the city of Urbana, Illinois, commented that the possibility of directing waste flows to a WTE facility can be used as a leveraging tool to encourage the good-faith negotiation of voluntary contracts. In Minnesota, flow control is considered a last resort, to be used only when voluntary agreements to deliver waste to designated facilities cannot be reached. Flow control ordinances can be adopted only after a series of public hearings and State approval.⁶

⁶U.S. Environmental Protection Agency, *Municipal Solid Waste Flow Control: Summary of Public Comments*, EPA 530-R-94-008 (Washington, DC, February 8, 1994), p. 7.

Figure 2. Capacity and Number of Waste-to-Energy Facilities by State, 1993
(Tons per Day)



Source: Figure developed by the Energy Information Administration, based on data from Eileen B. Berenyi and Robert N. Gould, *Resource Recovery Yearbook* (New York: Governmental Advisory Associates, Inc., 1993), pp. 229–670.

To understand the pros and cons of flow control, it is helpful to identify the winners and losers. Simply put, the winners are both those facilities that are designated to receive the waste and those municipalities that view flow control as an effective management tool. The losers are the potentially competing facilities that are not designated to receive the waste and—depending on whether the long-run, least-cost waste disposal options are chosen—the general public, which must pay for any economic inefficiencies with higher taxes and higher waste-disposal fees.

Municipalities generally support flow control because they view waste collection and disposal as public services, similar to sewage disposal, and thus the responsibility of government. Municipalities argue that the only difference between waste collection and sewage disposal is that trucks are used to haul the waste, whereas sewage is transported via sewage lines. Few would argue, they say, that sewage lines should be unregulated to allow several competitors to provide the same service in a given geographic area.

Municipalities also claim that they are legally liable for the safe and sanitary disposal of waste. Pollution problems, such as groundwater contamination, may not be fully known until many years after the pollution has occurred, by which time the landfill responsible for the pollution may be out of business or financially unable to meet its cleanup obligations. Municipalities consequently argue that they must control pollution problems at the outset by directing waste to environmentally sound disposal sites.⁷

The legal liability of the municipal governments comes in several forms. The Resource Conservation and Recovery Act of 1976 (RCRA, Public Law 94–580) requires State and local governments to have plans that require landfills to meet certain minimum standards. The RCRA regulations also require the owner or operator of a landfill to demonstrate financial capability for the cost of landfill closure, post-closure care, and any corrective action that may be necessary. RCRA, as amended by the Hazardous and Solid Waste Act Amendments of 1984 (Public Law 98–616), ensures that planning for WTE facilities takes into consideration the current and future recycling requirements of the community.^{8,9} Furthermore, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, Public Law 96–510), as amended by the Superfund Amendments and Reauthorization Act of 1986 (Public Law 99–499), holds local governments potentially liable for proper treatment of household hazardous waste that may work its way into the ordinary trash stream.¹⁰

Arguments against the use of flow control as a tool for MSW management are based on economic or legal grounds or both. Opponents claim that the designated flow may not be the least-cost approach. Among the opponents who claim that flow control is economically inefficient are some WTE companies and many recyclers. Others argue that it violates

⁷*Municipal Solid Waste Flow Control*, pp. 3–6.

⁸*Federal Register*, Volume 40 of the Code of Federal Regulations, Part 258, October 9, 1991, 56FR50978).

⁹42 U.S.C. 6905(b)(3).

¹⁰42 U.S.C.A. Section 9607.

anti-trust laws, unreasonably restrains interstate commerce, and constitutes the illegal seizure of property (discussed further below).

Flow control discussions bring out the classic arguments between those who advocate free markets and those who believe that government can and should be involved in solving society's problems. There is, however, general agreement that government needs to be involved in the production of some public goods and services. The issue that needs resolution is the degree of that involvement.

Legal History of Flow Control

The first legal challenge to flow control¹¹ occurred during the 1970's.¹² Hybud Equipment Corporation was a local waste hauler and recycler in Akron, Ohio. Until the city passed a flow control ordinance, the company separated certain recyclables for resale before delivering the waste to a disposal facility. The ordinance required that all the waste be taken directly to a particular WTE facility. Hybud argued that the ordinance restrained trade in violation of the Sherman Antitrust Act, that it imposed an impermissible burden on interstate commerce in violation of the commerce clause of the Constitution, and that it confiscated property without just compensation. The city of Akron argued that it was exempt from Federal antitrust laws as a result of the State action exemption (discussed in the next paragraph), that it was using police power with an insignificant effect on interstate commerce, and that it was not confiscating property. The Federal District Court and the U.S. Court of Appeals ruled in favor of the city of Akron. The courts' most significant finding was that the local government was acting pursuant to a State policy to substitute monopoly public service for competition in the waste disposal industry. The city was thus excused from compliance with Federal antitrust laws under the State action exemption.

This decision was appealed to the U.S. Supreme Court. However, before the case could be heard, the Supreme Court elaborated on the exemption of State actions.¹³ The Court found "that a local government can be liable for violation of antitrust laws for restraining trade unless (1) it is acting pursuant to a clear and affirmatively expressed State policy permitting restraint of trade; and (2) such policy is actively supervised by the State." The Court sent the Akron case back to the lower courts, where earlier decisions were ultimately upheld.

In a later case,¹⁴ the Court clarified the intent of the terms "State policy" and "active State supervision," ruling that local government actions are exempt from antitrust liability

¹¹For more detail and legal interpretations of individual cases, see William L. Kovacs and Martha E. Pellegrini, "Flow Control: The Continuing Conflict Between Free Competition and Monopoly Public Service," *Resource Recovery Report* (Washington, DC, December 1992). An update discussing the most recent U.S. Supreme Court decisions will be available in the summer of 1994.

¹²*Hybud Equipment Corp. v. City of Akron*, as cited in *Resource Recovery Report*.

¹³*Community Communications Co., Inc. v. City of Boulder*, as cited in *Resource Recovery Report*.

¹⁴*Town of Hallie v. City of Eau Claire*, as cited in *Resource Recovery Report*.

when such activities are generally authorized, but not necessarily compelled, by the State. The general-purpose clauses of most solid waste statutes would thus be considered sufficient authorization to protect local governments from antitrust laws.

As it became clear that plaintiffs could not win legal disputes by claiming that flow control ordinances violated antitrust laws, they initiated new challenges under the commerce clause of the U.S. Constitution. In 1978, the Supreme Court defined waste to be an article of interstate commerce that cannot be discriminated against unless there is some reason, apart from its origin, to treat it differently,¹⁵ or unless Congress specifies otherwise for particular articles of commerce.

Other Supreme Court decisions¹⁶ have defined an exception to the commerce clause, allowing States to restrict the flow of waste when they or local governments are participants in the waste disposal business (as owners of facilities and utilizing economic flow control), rather than acting as regulators. State and local governments could thus meet commerce clause challenges to flow control by changing their role to that of owner and operator of waste disposal facilities using subsidies, not ordinances, to control the flow of waste.

State and local governments thus faced a dilemma: whether, in developing waste plans, to act as market regulators or as market participants. State and local governments instituting flow control through legislation were market regulators and were vulnerable to challenges under the commerce clause. On the other hand, the use of economic mechanisms to control the flow of waste could cast governments as market participants and expose them to litigation under antitrust laws. For governments to be classified as market participants, they would actually have to own and operate waste facilities, either directly or through partnerships.

Court decisions concerning the applicability of the commerce clause in assessing the legal viability of flow control ordinances (i.e., local governments acting as market regulators) varied from case to case, but, until recently, certain patterns were evolving. The courts were more likely to rule in favor of such ordinances to the extent that the following principles were adhered to:

- The regulation had only incidental effects on interstate commerce.
- It treated in-State and out-of-State trash similarly.
- It represented a good-faith effort by local governments to deal effectively with local solid waste problems, but not at the expense of out-of-State individuals.

In 1992, the Supreme Court held that State-imposed waste import restrictions are illegal “economic protectionist”

¹⁵*City of Philadelphia v. State of New Jersey*, as cited in *Resource Recovery Report*.

¹⁶*Hughes v. Oklahoma*, and *Reeves v. Stake*, as cited in *Resource Recovery Report*.

measures.^{17,18} The Court ruled that Michigan’s solid waste management law, which prohibited private landfills from accepting out-of-county waste, violated the commerce clause and was, therefore, unconstitutional. The Court’s decision stated that “a State (or one of its political subdivisions) may not avoid the strictures of the Commerce Clause by curtailing the movement of articles of commerce through the subdivisions of the State, rather than through the State itself.” The Court ruled that the Michigan counties could provide safe disposal of future waste without discriminating between waste from different origins. Thus, the stage was set for a similar ruling in a flow control case.

On December 7, 1993, the Court heard oral arguments on a Clarkstown, New York, flow control ordinance requiring that all MSW generated within the town be delivered to the town’s own transfer station. The stated purpose of the ordinance was to maintain revenue to amortize the cost of the facility. A New York State court, which ignored the export barrier to the interstate movement of waste, ruled that the flow control ordinance did not violate the commerce clause because the ordinance “applies even-handedly to all solid waste processed within the Town regardless of point of origin.”

The Court ruled in May 1994 that the Clarkstown flow control ordinance was unconstitutional. The Court found that the ordinance regulated interstate commerce and was within the domain of the commerce clause. Although the immediate effect of the ordinance was to direct the local transport of solid waste to a designated site within the local jurisdiction, the Court said, the economic effects were interstate in reach. The ruling stated that, given the ordinance’s relevance to interstate commerce, case law dictates two constitutionality tests: (1) Does the ordinance discriminate against interstate commerce? and (2) Does the ordinance excessively restrict interstate commerce relative to the benefits gained by the local community? The Court found that the ordinance discriminated against interstate commerce because it drove up the cost of out-of-State waste disposal and deprived out-of-State businesses of access to the local market: “Discrimination against interstate commerce in favor of local business or investment is *per se* invalid, save in a narrow class of cases in which the municipality can demonstrate, under rigorous scrutiny, that it has no other means to advance a legitimate local interest.”¹⁹ Because the ordinance was found to discriminate against interstate commerce, the Court did not apply the second test.

In this case, the Court believed that Clarkstown had other means (nondiscriminatory alternatives) to address its waste disposal problems. Health and environmental problems could be remedied by enacting uniform safety regulations, for example. Further, if special financial arrangements were

¹⁷*Fort Gratiot Sanitary Landfill v. Michigan Department of Natural Resources* as cited in Richard S. Moskowitz, “Legal Issues Facing the Solid Waste Industry,” paper presented at an educational seminar sponsored by the National Solid Waste Management Association (Baltimore, MD, February 1994).

¹⁸For a more detailed discussion of recent Supreme Court cases and pending legislative actions, see “Legal Issues Facing the Solid Waste Industry.”

¹⁹The Court also ruled that Clarkstown’s action of directing waste away from out-of-town disposal sites for environmental reasons was an extension of the town’s police powers beyond its jurisdictional limits.

necessary to ensure the economic survival of the facility, the municipality could engage in economic flow control.

In summary, the Court held, in a far-reaching decision,²⁰ that the Clarkstown legislated flow control ordinance violated the commerce clause by discriminating against interstate trade and was therefore unconstitutional, unless Congress addressed the issue and granted such authority to the States. The Court also reiterated that States may not subvert the intent of the commerce clause by limiting the movement of articles of commerce through subdivisions of the State, rather than through the State itself.

It is not clear, however, how broad the effects of this decision will be in any particular State, given the different logistical flows of waste among and within States. Must a municipality near a State border follow different rules than a municipality hundreds of miles from any State border? In addition, although the Court ruled that municipalities can engage in economic flow control as an alternative to legislated flow control, economic flow control may be vulnerable to antitrust suits. How viable an alternative is economic flow control?

Although legislated flow control has been declared unconstitutional, Congress has the power, through its Constitutional authority to regulate interstate commerce, to pass legislation permitting it. The House of Representatives and the Senate have both drafted bills that would authorize flow control in one form or another. For example, the House Energy and Commerce Subcommittee on Transportation and Hazardous Materials has reported out a bill (H.R. 4683) that would authorize flow control if the laws, ordinances, or regulations were in effect, and the waste were designated to an existing or proposed waste management facility, by May 15, 1994. All such authority would terminate at the end of the useful life of the designated facility. In contrast, S. 2227, as proposed, is much less restrictive with respect to new facilities. Municipalities would be authorized to institute flow control for residential waste even if it were not currently in use.

In preparation for future legislation, Congress has asked EPA to undertake a detailed study of the impact of flow control on the entire MSW industry. The purpose of the study is to review States with and without flow control authority and to describe the impact of such legislation on the protection of human health and the environment, the development of State and local waste management capacity, and the achievement of State and local goals for source reduction, reuse, and recycling. The study is scheduled to be completed and delivered to Congress during the fall of 1994.

Trends in the Use of Flow Control

Almost all of the new WTE facilities that began operating from 1983 through 1993 secured their financing and waste supplies either with private contracts or with flow control contracts (Figure 3), and the use of both types of contracts grew rapidly during the period. Facilities using contracts

²⁰*C&A Carbone, Inc. v. Town of Clarkstown, New York*, No. 114, S. Ct. 1677 (1994).

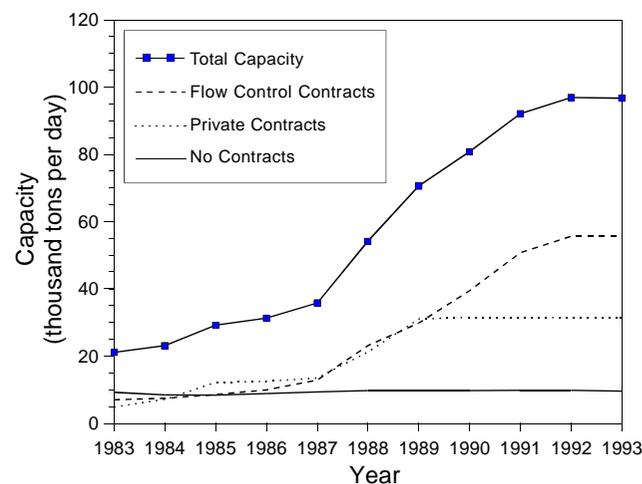
increased their share of the market at the expense of facilities not contractually securing waste supplies. By the early 1990's, growth in the market was dominated by facilities with flow control contracts or agreements.

This trend can be attributed, in part, to changes in the types of State and local debt instruments used to finance public investment, which have greatly influenced management practices in securing waste supplies for solid waste facilities. During the mid-1960's, general obligation bonds represented approximately two-thirds of long-term, tax-exempt debt, twice the amount of revenue bonds. Municipalities could more easily and cheaply raise capital if they could use their creditworthiness as collateral for repayment, as is the case with general obligation bonds. However, as municipalities sought to minimize their financial exposure and liability and to relieve the burden on general obligation bond limits, revenue bonds (which are secured only with the revenues from the financed project, such as a particular waste disposal facility) came to dominate the market. By the 1980's, the revenue bond share had grown to between two-thirds and three-fourths of the market.²¹ Flow control was available as a convenient tool to assure potential investors that there would be sufficient funds to repay the debt at the agreed rate of interest. When this tool was not available in a State or was not the preferred technique, private contracts were negotiated.

With revenue bonds replacing general obligation bonds as the dominant debt instrument used to finance investments in solid waste disposal, the WTE industry had to grow and mature without the benefit of having State and local governments directly guarantee the financial security of their facilities. If financial security was required for bonds, or simply as good business practice, flow control and private contracts were available.

²¹Curlee, T. Randall, et al., *Waste-to-Energy in the United States: A Social and Economic Assessment* (Westport, CT: Quorum Books, 1994), p. 119.

Figure 3. Trends in Securing Waste for Waste-to-Energy Facilities, 1983–1993, End of Year



Source: Figure developed by the Energy Information Administration, based on data from Eileen B. Berenyi and Robert N. Gould, *Resource Recovery Yearbook* (New York: Governmental Advisory Associates, Inc., 1993), pp. 229–670.

At the end of 1983, 44 percent of the total WTE capacity of 21,182 tons per day operated without any type of arrangement to secure waste supplies (Figure 3). Most of the capacity that came on line from 1983 through 1989 did have such arrangements, and facilities without them represented only 14 percent of total capacity at the end of the period. Private or flow control contracts represented 44 percent and 42 percent, respectively, of the total WTE capacity of 70,631 tons per day at the end of 1989.

During the second half of the 1980's, changes in comprehensive waste management goals influenced the type of contracts chosen by the WTE industry. Environmental standards for both airborne emissions from WTE facilities²² and groundwater contamination from landfilled combustion ash became more stringent²³ and recycling became an integral part of waste management. More than 140 recycling-related laws were enacted by 38 States in 1990. Most of these States and the District of Columbia now have comprehensive laws that require recycling.²⁴ Based on testimony by State and local officials at EPA-sponsored public meetings in late 1993,²⁵ municipalities overwhelmingly believe that directing the flow of waste to specific facilities helps them achieve recycling goals and meet more stringent environmental standards for waste disposal. Of the 61 commenters, 59 supported flow control as a waste management tool. (Two local governments preferred free markets.)

Supporters favored flow control for three main reasons. First, flow control ensures the economic viability of designated facilities and provides the financial assurance that investors and bond ratings firms require. Second, solid waste management is the inherent responsibility of municipal government and flow control allows for effective and environmentally responsible solid waste planning and management. With this technique as the foundation, an integrated solid waste management system can be developed and implemented. (For example, flow control can ensure that food and yard wastes go to a compost facility, mixed waste goes to a transfer station for recycling, and combustible waste goes to an incinerator.) Finally, municipalities are ultimately liable for local environmental problems regardless of ownership or fault. Flow control supporters argued that the liability and the authority to direct waste to environmentally safe facilities should go hand in hand (although liability was not as important an issue to municipalities as were economic security and waste management).

Although municipalities have overwhelmingly adopted flow control in recent years, there is no conclusive evidence to support the contention that flow control leads to the most economically efficient waste disposal.²⁶ Flow control allows municipalities to control recycling levels, monitor recycling

achievements, and discreetly pay for recycling with higher tipping fees. With a few exceptions, the depressed market prices of recycled products do not cover the cost of recycling.

During the period from 1990 through 1993, only three non-flow-control facilities have become operational, with a total capacity of less than 1,200 tons per day. Two of these facilities had private contracts. The third, built with city revenues, did not contractually secure waste supplies. During the same period, 21 flow control facilities with almost 27,000 tons per day total capacity have become operational (Figure 3).²⁷ Most of this capacity is in States that had extensive waste recycling programs by 1990 (Table 1). Those programs consist of recycling goals and various forms of recycling legislation. Hawaii is the only State that added WTE capacity during this period that was not extensively involved in recycling. During EPA's public meetings, officials from Hawaii said that the primary use of flow control in their State is to direct waste to a WTE facility in order to extend landfill life.²⁸ In other States, recycling legislation consists of mandatory development of local recycling programs, or ordinances and specified waste reduction goals that localities may choose to meet, in part, through recycling. Recycling goals range from 20 percent to 50 percent of annual waste totals.²⁹

The WTE industry's history may offer clues to its future business practices. According to a database compiled by the private consulting group Governmental Advisory Associates, there were 114 WTE facilities as of the end of 1992. An additional 29 facilities had been built during the period from 1978 through 1992 but had gone out of business. Of the latter, 15 facilities (representing 72 percent of the failed capacity) did not have contracts to secure waste supplies (Figure 4). Of the 114 surviving facilities, 55 (representing 58 percent of total surviving capacity) operate with flow control contracts and 35 (33 percent of total capacity) have private contracts. The remaining 24 facilities (9 percent of capacity) do not have contractually secured waste supplies. The surviving facilities are larger than the failed facilities, which generally did not represent as substantial investments.³⁰

Whereas most construction bonds for WTE facilities are secured with guarantees to supply an amount of waste equal to 85 percent of capacity,³¹ eight of the 29 facilities that went out of business from 1978 through 1992 reported capacity utilization rates under 70 percent in their last year of operation. Seven of these eight facilities did not have contracts securing waste supplies. The surviving facilities had higher utilization rates: only four of the 90 surviving facilities with

²²C. David Gaige and Richard T. Halil, Jr., "Clearing the Air About Municipal Waste Combustors," *Solid Waste & Power*, Vol. 6, No. 1 (January/February 1992), pp. 12-17.

²³Jonathan Kiser, "Municipal Waste Combustion Ash: Recent Developments," *Environmental & Waste Management World*, Vol. 6, No. 5 (June 1992), pp. 1-2.

²⁴National Solid Wastes Management Association, *Recycling in the States, 1990 Review* (Washington, DC, September 1991).

²⁵*Municipal Solid Waste Flow Control*, pp. 3-6.

²⁶The overall efficiency of flow control is being addressed in EPA's study to be delivered to Congress in the fall of 1994.

²⁷*Resource Recovery Yearbook*, pp. 229-670.

²⁸*Municipal Solid Waste Flow Control*, p. 4.

²⁹Jim Glenn and David Riggle, "The State of Garbage in America, Part II," *Biocycle* (May 1991), pp. 30-35.

³⁰*Resource Recovery Yearbook*, pp. 229-670. This discussion does not include three facilities in the Governmental Advisory Associates database that were temporarily shut down for retrofit.

³¹Personal communication with Herb Kosstrin of R.W. Beck on March 2, 1994. R.W. Beck conducts feasibility studies for WTE facilities prior to the issuance and rating of bonds. This information was confirmed by personal communication with David Livingstone of Smith Barney Shearson, one of the major underwriters of WTE bonds.

either flow control or private contracts had capacity utilization rates under 70 percent, and six of the 24 surviving facilities without contracts had capacity utilization rates under 70 percent. In general, there was little difference between the capacity utilization rates of facilities with private contracts and those with flow control contracts.

Because legislated flow control was ruled unconstitutional, its future rests with Congress. Bills now under consideration would protect flow control ordinances and agreements that meet certain conditions. One of the issues to be resolved is whether legislated flow control should be made available for new capacity. If not, it is likely that new capacity will be constructed in conjunction with economic flow control arrangements (for non-merchant facilities) and private contracts. Municipalities will probably be less interested in owning WTE facilities. If so, it would tend to open up the market for merchant facilities and reduce the impact of the shift towards public ownership resulting from the Tax Reform Act of 1986, discussed in the following section.

Impact of the Tax Reform Act of 1986 on WTE Capacity

The Tax Reform Act of 1986 has influenced ownership decisions (private versus public) in the WTE industry and

waste disposal choices (capital-intensive WTE versus less capital-intensive options such as landfilling) in the MSW industry as a whole. The 1986 act modified several decades of earlier tax laws, which can be broken down into two categories: those directly lowering the rate of return on capital investments and those placing allocation caps on tax-free private activity bonds (PAB's).

A brief review of earlier tax laws may clarify the intent of the 1986 act. The first income tax law, passed in 1913, exempted interest earned on bonds issued by State and local governments from taxable income. As a response to increased use of bonds issued for private purposes, the Revenue and Expenditure Control Act of 1968 made the first attempt to distinguish public purpose tax-exempt bonds from private purpose taxable bonds. This law coined the term "Industrial Development Bonds" (IDB's) for taxable bonds. A bond was taxable if more than 25 percent of its proceeds were used by a private business and secured by private business property. The Deficit Reduction Act of 1984 limited IDB's to the greater of \$150 per State resident or \$200 million.³² The Tax Reform Act of 1986 added further limitations to the States' use of tax-exempt bonds.

³²Dennis Zimmerman, *The Private Use of Tax-Exempt Bonds*, (Washington, DC: The Urban Institute Press, 1991), Chapter 11.

Table 1. 1990 Recycling Characteristics of States With New Operating Waste-to-Energy Facilities, 1990–1993

State	1990 Recycling Characteristics		New WTE ^a Capacity (Tons per Day)			
	Goal (Percent of Waste)	Legislation ^b	1990	1991	1992	1993
Alabama	None	MP, MR	690(F)	0	0	0
Connecticut.....	25	MO	0	300(C)	600(F)	0
Florida.....	30	MR	0	2,250(F) 528(F) 2,250(F) 1,050(F)	0	0
Hawaii.....	None	None	0	2,160(F)	0	0
Maine.....	50	None	0	0	200(F)	0
Michigan.....	20–30	None	625(F)	0	0	0
Minnesota.....	35	MP,MR	1,200(F)	0	0	0
New Jersey.....	25	MO,MR	2,277(F) 575(C)	1,050(F)	0	0
New York.....	40–42	MO	0	750(F) 518(F)	400(F)	0
Pennsylvania.....	25	MO	0	1,200(F) 1,344(F)	2,688(F) 1,200(F)	0
Virginia.....	25	MP,MR	3,000(F)	0	0	0
Washington.....	None	MP	0	800(F) 300(U)	0	0

^aWTE=Waste-to-energy. F=One WTE facility utilizing flow control. C=One WTE facility utilizing private contracts. U=One WTE facility without waste supply contracts.

^bMP=States with legislation requiring local governments to develop recycling programs. MR=States with legislation requiring local governments to reach specified waste reduction goals of which recycling may be a part. MO=States with legislation requiring municipalities to pass mandatory recycling ordinances.

Source: Jim Glenn and David Riggle, "The State of Garbage in America, Part II," *Biocycle* (May 1991), pp. 30–35.

The Tax Reform Act of 1986 divided State and local bonds into government bonds and PAB's. (The term IDB was eliminated.) The definition of private activity was changed by further limiting the private share of the activity. A private entity could use no more than 10 percent of the bond proceeds, or secure no more than 10 percent of the bonds with private property or revenues, to maintain the preferred government bond classification (Table 2).³³ Bonds that did not exceed this 10-percent limitation were classified as government bonds and maintained their tax-exempt status.

Under the 1986 act, PAB's (bonds that exceed the 10-percent limitation) can be tax-exempt³⁴ only if they are determined to be qualified bonds. To meet this classification, 95 percent of the bond proceeds must be used for qualified investments, such as a WTE facility. Qualified investments can be undertaken with tax-exempt bonds only to the extent that each State's volume caps are not exceeded. The act further tightened the volume caps and phased them in between 1986 and 1988 to a limitation of \$50 per capita or \$150 million per State, whichever is greater. Municipalities must prioritize their use of PAB's in any given year and plan for the future, since unused caps may be carried forward to future years.³⁵

The 1986 act also eliminated the investment tax credit and lengthened depreciation schedules for WTE facilities. WTE facilities completed after the act became law can still qualify for the pre-tax depreciation schedules and investment tax credits if two conditions were met prior to March 2, 1986: (1) there was a written binding contract between the various parties, and (2) a commitment of at least \$200,000 had been made to finance or construct the facility.³⁶ In some States, there are other ways to build a facility and still qualify for treatment under the old tax laws, but the one mentioned above appears to be the most commonly used.

The elimination of tax credits, the extension of depreciation schedules, and other tax changes have reduced the amount of capital private firms are willing to invest to ensure that an acceptable and competitive rate of return would be maintained. Consider, for example, a 1,500-ton-per-day WTE facility with capital costs of \$150 thousand per ton and a typical operating capacity of 85 percent. A firm that would have been willing to invest 17.5 percent of total costs under the old tax laws now must limit that investment to only 6 percent of total costs under the new tax laws in order to maintain the same 15 percent rate of return on equity. The other 11.5 percent of the capital costs would have to be financed with additional bonds and paid for with higher tipping fees. Tipping fees would have to rise by approximately 14 percent to fund the additional debt.³⁷

³³U.S. Government Accounting Office, *Environmental Infrastructure: Effects of Limits on Certain Tax-Exempt Bonds*, GAO/RCED-94-2 (Washington, DC, October, 1993).

³⁴Interest income from PAB's is included in calculations for the alternative minimum tax.

³⁵Jeremy A. Spector, "Tax-Exempt Financing For Solid and Hazardous Waste Facilities," *Tax Notes* (May 29, 1989), pp. 1157-1167.

³⁶Commerce Clearing House, Inc., *933 CCH-Standard Tax Reports*, Code 168(i)(13)(B)(iv) (Washington, DC, 1992), p. 11250.

³⁷Based on cash flow analysis by David Livingstone of Smith Barney Shearson, one of the major underwriters of WTE bonds.

By thus being unable to bring as much financial clout to the bargaining table, the negotiating position of private firms has been substantially weakened. Moreover, WTE facilities have typical life expectancies of approximately 40 years and public ownership means that the benefits accrue to the public, rather than private individuals, for some time after the 25-year bonds are paid off. Even if municipal governments decide against public ownership of WTE facilities, funding less capital-intensive waste disposal facilities that are less significantly affected by the tax law changes requires smaller increases in tipping fees. A WTE facility, for example, may cost \$100 million to \$200 million, whereas a landfill may cost only \$20 to \$30 million.³⁸

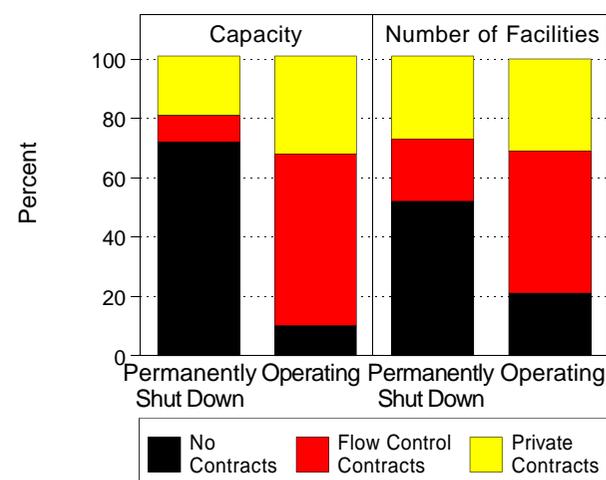
To the extent that privately owned WTE facilities are constructed, it is likely that most of them will be merchant facilities, as opposed to those facilities that are closely affiliated with a municipality. Merchant facilities are potentially high-profit, high-risk facilities that operate purely at the whim of market forces and rely on neither legislated nor economic flow control.

The second category of tax-law changes, the allocation caps for tax-free PAB's, is also likely to favor public ownership of WTE facilities. According to a study by the U.S. Government Accounting Office (GAO),³⁹ caps are likely to shift some capital investments in solid waste facilities from the private sector to the public sector. The conclusion is based, in part, on increasing requirements for investments in environmental infrastructure (solid waste, wastewater treatment, and drinking water facilities) that may compete unfavorably with more politically popular uses of PAB's. As demand for waste

³⁸*Environmental Infrastructure*, p. 29.

³⁹*Environmental Infrastructure*, p. 26.

Figure 4. Comparison of Characteristics of Permanently Shut Down Facilities and Operating Facilities, 1993



Note: Data represent 114 permanently operating facilities with 96,739-ton-per-day capacity and 29 permanently shut down facilities with 6,835-ton-per-day capacity, as of 1993.

Source: Figure developed by the Energy Information Administration, based on data from Eileen B. Berenyi and Robert N. Gould, *Resource Recovery Yearbook* (New York: Governmental Advisory Associates, Inc., 1993), pp. 229-670.

disposal facilities increases and some State and local governments near their allocation caps, they may be forced to choose public ownership and issue public bonds not subject to the cap.

The GAO study concluded that current investments in environmental infrastructure have not kept pace with the rapid growth in Federal environmental requirements. The study cited EPA estimates to the effect that local government costs (both capital costs and operations and maintenance costs) for complying with environmental regulations will increase from \$18.5 billion in 1990 to \$27.7 billion in 2000. This annual average growth rate of 4.5 percent is substantially higher than anticipated increases in population or gross national product.⁴⁰

Investments in environmental infrastructure, including solid waste facilities, must compete with other uses of PAB's, such as mortgage revenue bonds, student loans, and multifamily housing. The selection process varies from State to State, but uses that are more popular politically usually fare better than waste facilities. In 1989, solid waste facilities accounted for about 10 percent of the \$15.2 billion in PAB's issued. Investments in solid waste, both public bonds and PAB's, are expected to grow to \$5.1 billion in 2000.⁴¹

States with the largest populations and the most serious waste disposal problems are subject to the minimum PAB allocation. Populous States, such as New Jersey, New York, and California, have a cap of \$50 per person. States with fewer than 3 million people receive an allocation cap of more than \$50 per person. For example, the State of Delaware receives an allocation of \$223 per capita. Thus, from the standpoint of solid waste management, the States that need solid waste investments the most have stricter allocation limitations.

A survey of the States, which analyzed requests for volume cap allocations that were not approved during 1989 as a result of unavailability of volume cap, supported the conclusion of the GAO study. Twenty-seven States reported delayed or denied projects totaling approximately \$6 billion. Over \$2 billion of these bonds were for solid

waste disposal. However, some of the States that denied projects were not near their current caps; they may have denied projects so that they could carry funds over to future years.⁴²

The 1986 Tax Reform Act and Its Relationship to Flow Control

Since 1986, the private sector's annual share of municipal bonds for solid waste facilities has decreased (Table 3).⁴³ Almost 90 percent of the municipal bonds issued for solid waste facilities in 1986 were for privately owned facilities, compared with about 50 percent in 1993. The private sector's large share of the market during this period can be partially attributed to accelerated activity aimed at getting projects started so that they could be built under the more favorable tax laws in effect before 1986. In 1985 alone, permits to construct 42,620 tons per day of new WTE capacity were issued, compared with permits for 53,790 tons per day of capacity in all the years prior to 1985.⁴⁴ Almost all of the privately owned WTE facilities that have come on line since 1986 have reaped the tax benefits of the old tax laws. The private sector's declining annual share of the market from 1986 to 1993 is probably attributable to the shrinking opportunities to qualify for those tax benefits.

The private sector share of the total waste disposal market, particularly the WTE market, could decline in the future. The cost advantage of private waste facilities was substantially curtailed by the 1986 tax reform law. Public officials, faced with increasing demands for PAB's and tighter constraints on their issuance, may restrict use of PAB's for WTE facilities. Even if public officials seeking to avoid the political problems of owning waste disposal facilities allow PAB's to be issued, less capital-intensive private waste disposal facilities,

⁴²Advisory Commission on Intergovernmental Relations, *The Volume Cap for Tax-Exempt Private-Activity Bonds: State and Local Experience in 1989*, M-171 (Washington, DC, July 1990), pp. 27-28.

⁴³Andy Nybo, Public Securities Association, New York, NY, personal communication (June 1994), based on data from Public Securities Data Company.

⁴⁴Kidder, Peabody, *Waste-to-Energy Industry* (New York, NY, March 1993), p. 7.

Table 2. Rules Governing Tax-Exempt Bonds for Private Activities Before and After 1986

Issue	Before the 1986 Tax Act	After the 1986 Tax Act
Definition of a private activity.....	More than 25 percent of bond proceeds used by a private entity and used to secure property used by or revenues derived from a private entity	More than 10 percent of bond proceeds used by a private entity or used to secure property used by or revenues derived from a private concern
Volume cap.....	No unified volume cap; cap on certain private activities	Phased-in unified volume cap; in 1986, \$75 per capita or \$250 million; in 1988 and later, \$50 per capita or \$150 million
Investment tax credit	10 percent of certain investments	None
Depreciation	5-year depreciation schedule	Depreciation schedules lengthened, depending on type of environmental facility

Source: U.S. Government Accounting Office, *Environmental Infrastructure: Effects of Limits on Certain Tax-Exempt Bonds*, GAO/RCED-94-2 (Washington, DC, October, 1993).